Run IIb Project Status

Vivian O'Dell

Run IIb Upgrade Project

- Project Status Overview
  - Project Highlights
  - Schedule
  - Costs

Project Highlights

- Trigger (see talk by Darien Wood)
  - Full system integration work going well in general
    - Some problems moving L1 Cal into (parasitic) stable operations
      - Additional engineering from FNAL has been a big help
    - V15 (RunIIb trigger list) design far advanced
      - Benefits from new trigger are clear from the trigger studies
- Silicon Layer 0 (see talk by Bill Cooper)
  - L0 team focussed on
    - Full system tests (with final L0 detector)
    - Cosmic ray testing (with spare modules)
    - RunIIb beampipe preparation
    - Installation procedure refinement, testing, documenting
- AFEII-t (see talk by Paul Rubinov)
  - TripT testing finally in "production" stage
    - Many struggles with automated testing
    - Some schedule slippage however:
      - TripT chip yield >70% -- will not need 2nd cycle of chip production
        - Several months schedule impact
    - Major focus now on:
      - Platform test of AFEII-t boards
      - Testing of preproduction AFEII-t boards
- Online
  - Complete.
    - Working on a closeout report.

Project Schedule: Director's Milestones

L2/Director's Milestones vs Current Forecast (Sorted by L2/Director's Baseline Date)						
Milestone Description	**L2/Director's Baseline (12/05)**	**Last Month's Forecast (11/05)**	**This Month's Forecast (12/05)**	**L2/Director's Variance in work days**	**Monthly Variance in work days**	**Notes**
WBS 1.2 Trigger						
L1 Calorimeter Trigger TAB/GAB Prototyping Complete	05/03/04	05/26/04	05/26/04	18	0	Complete
Start Production TAB Fabrication	02/25/05	10/08/04	10/08/04	(90)	0	Complete
L2 Silicon Track Trigger Production and Testing Complete	10/17/05	12/20/05	12/30/05	48	4	Complete
L1 Trigger Cal-Trk Match Production and Testing Completed	01/03/06	01/19/06	01/19/06	12	0	
L1 Calorimeter Trigger Production And Testing Complete	01/05/06	04/29/05	04/29/05	(167)	0	Complete
L2 Beta Trigger Production And Testing Complete	01/05/06	08/16/05	08/16/05	(92)	0	Complete
L2 Trigger Upgrade Production and Testing Complete	01/05/06	12/20/05	12/30/05	(2)	4	Complete
L1 Central Track Trigger Production And Testing Complete	01/10/06	12/14/05	01/30/06	13	25	
L1 Trigger Upgrade Production and Testing Complete	04/10/06	01/19/06	01/30/06	(49)	7	
WBS 1.3 Online/DAQ						
Online System Production and Testing Complete	10/07/05	05/23/05	05/23/05	(96)	0	Complete
WBS 1.6 Layer 0 Silicon Detector						
Freeze Mechanical Parameters	01/06/04	12/15/03	12/15/03	(9)	0	Complete
Release Sensors for Production	05/26/04	02/26/04	02/26/04	(63)	0	Complete
Release Hybrids for Production	06/04/04	03/25/04	03/25/04	(50)	0	Complete
Release Analog Cables for Production	06/04/04	03/19/04	03/19/04	(54)	0	Complete
All Analog Cables Delivered and Tested	03/11/05	08/10/04	08/10/04	(141)	0	Complete
All Sensors Delivered and Tested	05/23/05	09/28/04	09/28/04	(159)	0	Complete
All L0 Hybrids Delivered, Stuffed, and Tested	08/25/05	01/25/05	01/25/05	(150)	0	Complete
All Adapter Cards Delivered and Tested	10/17/05	05/20/05	05/20/05	(98)	0	Complete
Silicon L0 Module Production Complete	11/29/05	04/22/05	04/22/05	(151)	0	Complete
Layer 0 Silicon Detector Ready to Move to DAB	05/25/06	03/01/06	03/08/06	(55)	5	
WBS 1.7 AFEIIt						
AFEII Boards Complete	09/29/06	10/16/06	06/26/06	(66)	(76)	

Cost Performance Report 12/31/05

Contractor: / Location:				Contract Type/No:		Project Name/No:		Report Period:	
						D0MASTER 1		11/30/2005	12/31/2005
Quantity	Negotiated Cost	Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %	Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling
1	8,784,000	0		0	0.00 8,784,000	0		0	0

Funding-CA / WBS[2] / WBS[3] / Item	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance				
	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Latest Revised Estimate	Variance
EQU Equipment													
1.2 Run IIb Trigger Upgrade													
1.2.1 Level 1 Calorimeter Trigger	0	0	102,407	0	-102,407	1,102,834	1,051,473	1,447,402	-51,361	-395,929	1,102,834	1,168,139	65,304
1.2.2 Level 1 Calorimeter Track Matching	0	80	0	80	80	257,773	257,607	231,225	-165	26,382	257,773	252,080	-5,693
1.2.3 Level 1 Tracking	0	0	0	0	0	690,070	674,565	598,734	-15,505	75,831	690,070	681,869	-8,201
1.2.4 Level 2 Beta Processor	0	0	0	0	0	59,891	59,891	60,166	0	-275	59,891	59,891	0
1.2.5 Silicon Track Trigger Upgrade	0	35,659	479	35,659	35,179	223,767	223,767	111,042	0	112,725	223,767	223,767	0
1.2.7 Administration	0	0	22,293	0	-22,293	6,699	6,699	86,011	0	-79,312	6,699	0	-6,699
WBS[2]Totals:	0	35,739	125,179	35,739	-89,441	2,341,034	2,274,003	2,534,582	-67,032	-260,579	2,341,034	2,385,745	44,711
1.3 Online Systems													
1.3.1 Level 3 Systems	0	0	0	0	0	264,868	264,868	242,571	0	22,297	264,868	264,868	0
1.3.2 Network and Host Systems	0	0	0	0	0	423,948	423,948	250,584	0	173,364	423,948	423,948	0
1.3.3 Control Systems	0	0	0	0	0	219,494	219,494	156,512	0	62,982	219,494	219,494	0
1.3.4 DAQ/Online Management	0	0	0	0	0	17,824	17,824	216	0	17,608	17,824	17,824	0
WBS[2]Totals:	0	0	0	0	0	926,134	926,134	649,884	0	276,251	926,134	926,134	0
1.4 Run IIb Project Administration													
1.4.1 FY03	0	0	0	0	0	284,518	284,518	129,158	0	155,359	284,518	284,518	0
1.4.2 FY04	0	0	0	0	0	222,002	222,002	231,129	0	-9,127	222,002	222,002	0
1.4.3 FY05	0	0	15,124	0	-15,124	229,649	229,649	253,066	0	-23,417	229,649	229,649	0
1.4.4 FY06	23,671	23,671	0	0	23,671	69,937	69,937	0	0	69,937	118,355	118,355	0
WBS[2]Totals:	23,671	23,671	15,124	0	8,547	806,106	806,106	613,354	0	192,752	854,524	854,524	0
1.6 Layer 0 Silicon Detector													
1.6.7 L0 Installation Preparation	0	0	17,222	0	-17,222	262,328	262,328	417,262	0	-154,934	262,328	273,190	10,861
1.6.1 Sensors	0	0	0	0	0	21,182	21,182	21,710	0	-529	21,182	21,182	0
1.6.2 Readout Electronics	0	0	0	0	0	261,431	261,431	348,330	0	-86,898	261,431	261,431	0
1.6.3 Mechanical Design and Fabrication	0	0	9,524	0	-9,524	346,307	346,307	470,248	0	-123,941	346,307	346,307	0
1.6.4 Layer 0 Detector Modules	0	0	0	0	0	124,637	124,637	244,046	0	-119,409	124,637	124,637	0
1.6.5 Final Detector Integration and Assembly	0	0	1,567	0	-1,567	253,335	226,556	369,887	-26,778	-143,330	253,335	330,560	77,226
1.6.6 Silicon Project Administration	0	0	0	0	0	65,853	65,853	13,243	0	52,609	65,853	73,373	7,520
WBS[2]Totals:	0	0	28,312	0	-28,312	1,335,073	1,308,295	1,884,725	-26,778	-576,431	1,335,073	1,430,680	95,607
1.7 AFE II/TriP													
1.7.3 Prototype - AFE II t	0	0	1,846	0	-1,846	35,230	35,230	9,947	0	25,283	35,230	49,533	14,304
1.7.4 TriPt	103,926	275,597	13,908	171,671	261,688	475,332	536,944	289,429	61,611	247,515	539,627	276,061	-263,566
1.7.5 Full Board Set (AFEIIt) Production and Test	106,708	9,571	122,131	-97,137	-112,560	450,927	440,744	559,390	-10,184	-118,647	964,068	963,615	-453
1.7.6 Code Development	0	0	0	0	0	33,328	33,328	0	0	33,328	33,328	33,328	0
WBS[2]Totals:	210,634	285,168	137,886	74,534	147,282	994,817	1,046,245	858,765	51,428	187,479	1,572,253	1,322,537	-249,715
Funding-CATotals:	234,305	344,577	306,502	110,272	38,076	6,403,165	6,360,783	6,541,310	-42,382	-180,527	7,029,018	6,919,621	-109,398
Sub Total	234,305	344,577	306,502	110,272	38,076	6,403,165	6,360,783	6,541,310	-42,382	-180,527	7,029,018	6,919,621	-109,398
Management Resrv.											1,754,981	1,864,387	1,284,398
Total	234,305	344,577	306,502	110,272	38,076	6,403,165	6,360,783	6,541,310	-42,382	-180,527	8,784,000	8,784,000	1,175,000

CPR – Some issues

- Trigger
  - L1 Cal Trigger shows large cost overrun
    - Due to ~$80k of double counting (invoice/accrual)
    - Rest of the overrun is due mainly to FNAL labor, some M&S for cabling
  - L1CTT, L2STT show large cost underruns
    - Still waiting for invoices from BU
  - Administration overrun
    - Costs for guests for trigger
- Online system
  - Upgrade successfully completed, all costs are in, working on closeout report
  - Underrun here caused (mainly) by underrun in labor costs
- PA – have not yet started charging on FY06.
  - This should happen for January reporting.
- Layer 0
  - Cost overrun (due to labor) at a rate of ~30k/month
  - Expect this to continue until project complete (beginning of March)
- AFEII-t
  - 2nd TripT cycle removed from schedule
  - Right now still shows up in earned value (an additional ~$230k), but this will be fixed for January reporting.
  - Some cost overruns in AFEII production (labor) already apparent. We will have to keep an eye on this and make sure we have budget for it.

Online spending

RunIIb D0 Online Computing Equipment (1.3) Budget					
					Revised 09-Feb-2006
Description		Budget		Costed Sum Category	Item
Online		$ 605,000.00		$ 557,380.29	
	1.3.1 Level 3 Farm nodes		$ 210,000.00	$ 207,822.08	128 L3 nodes + infrastructure
	1.3.2 Host Systems		$ -	$ -	
	1.3.2.1 Network		$ -	$ 28,934.90	Network switch upgrade
	1.3.2.4.2 SAN and JBOD Storage		$ 60,000.00	$ 49,151.00	FC SAN, JBOD disks
	1.3.2.4.3 RAID Storage		$ 43,000.00	$ 41,102.00	4 TB RAID arrays
	1.3.2.6 DAQ Host Systems		$ 52,000.00	$ 33,335.00	5 servers
	1.3.2.7 Oracle Systems		$ 52,000.00	$ 21,366.00	4 servers
	1.3.2.8 File Server Systems		$ 40,000.00	$ 41,732.00	8 servers
	1.3.3 Control Systems		$ 148,000.00	$ 133,751.33	41 SBCs
	1.3.4 Online Group Management		$ -	$ 185.98	Software

- **No overhead, actual $$ spent compared to original estimate.**
- **Bottom Line: M&S estimate and bookkeeping extremely good.**
- **Overall cost underrun (~ $275k) due to overestimate in labor costs.**
- **(Stu did most of the work himself – I think the lab owes him a (domestic) beer!)**

DOE MIE Current Spending Estimate To Completion

D0 RIIb EQU - December FYO6 IN $K Task Number	Expenditure Category	Current Month Total Cost	Current Month Obligation	YTD Total Cost	YTD Obligations w/Indirect	Current PO Open Comm	Current Reqs In Process	Prior Yr Total Cost	Total Project Cost by WBS Level 2
Trigger	M&S	100.6	3.1	138.2	(229.5)	(116.7)	4.8	1,929.1	
	SWF	16.2	16.2	71.9	71.9	0.0	0.0	223.9	
	OH	8.4	0.0	31.3	31.3	0.0	0.0	140.2	
	Total 1.2	125.2	19.2	241.4	(126.3)	(116.7)	4.8	2,293.2	2,534.6
Online	M&S	0.0	0.0	(2.0)	(2.0)	0.0	0.0	561.0	
	SWF	0.0	0.0	0.0	0.0	0.0	0.0	0.8	
	OH	0.0	0.0	(0.3)	(0.3)	0.0	0.0	90.4	
	Total 1.3	0.0	0.0	(2.3)	(2.3)	0.0	0.0	652.2	649.9
Administration	M&S	0.0	0.0	0.0	0.0	0.0	0.0	19.1	
	SWF	11.6	11.6	35.8	35.8	0.0	0.0	419.1	
	OH	3.6	0.0	11.1	11.1	0.0	0.0	128.2	
	Total 1.4	15.1	11.6	46.9	46.9	0.0	0.0	566.4	613.4
Layer 0 Silicon	M&S	2.7	5.9	17.9	22.1	13.2	0.0	206.6	
	SWF	19.2	19.2	109.5	109.5	0.0	0.0	1,138.9	
	OH	6.5	0.0	37.4	37.4	0.0	0.0	374.4	
	Total 1.6	28.3	25.1	164.8	169.0	13.2	0.0	1,719.9	1,884.7
AFEIIt	M&S	60.3	8.4	282.2	237.2	308.2	0.0	332.8	
	SWF	51.8	51.8	98.2	98.2	0.0	0.0	11.7	
	OH	25.8	0.0	76.7	76.7	0.0	0.0	57.1	
	Total 1.7	137.9	60.1	457.1	412.1	308.2	0.0	401.7	858.8
Total Project	M&S	163.6	17.4	436.3	27.8	204.7	4.8	3,048.7	
	SWF	98.7	98.7	315.4	315.4	0.0	0.0	1,794.4	
	OH	44.3	0.0	156.2	156.2	0.0	0.0	790.3	
Grand Total		306.5	116.1	907.9	499.4	204.7	4.8	5,633.5	6,541.4

Total Project Cost (Inception To Date) =	6,541.4
Total Project Obligations w/Indirect =	6,746.1

(Project Total MIE $7,029+$1,755 = $8,784)

Total MIE Costs Through 12/30/05
Includes PO's, but not RIPS
Does NOT include RunIIb Silicon + Closeout Costs

DOE MIE Current Spending Estimate To Completion

D0 RIIb EQU - December FYO6 IN $K Task Number	Expenditure Category	Current Month Total Cost	Current Month Obligation	YTD Total Cost	YTD Obligations w/ Indirect	Current PO Open Comm	Current Reqs In Process	Prior Yr Total Cost	Total Project Cost by WBS Level 2
Silicon Detector	M&S	0.0	0.0	0.0	0.0	0.0	0.0	988.5	
	SWF	0.0	0.0	0.0	0.0	0.0	0.0	618.4	
	OH	0.0	0.0	0.0	0.0	0.0	0.0	327.7	
	Total 1.1	0.0	0.0	0.0	0.0	0.0	0.0	1,934.5	1,934.5
Trigger	M&S	100.6	3.1	138.2	(229.5)	(116.7)	4.8	1,929.1	
	SWF	16.2	16.2	71.9	71.9	0.0	0.0	223.9	
	OH	8.4	0.0	31.3	31.3	0.0	0.0	140.2	
	Total 1.2	125.2	19.2	241.4	(126.3)	(116.7)	4.8	2,293.2	2,534.6
Online	M&S	0.0	0.0	(2.0)	(2.0)	0.0	0.0	561.0	
	SWF	0.0	0.0	0.0	0.0	0.0	0.0	0.8	
	OH	0.0	0.0	(0.3)	(0.3)	0.0	0.0	90.4	
	Total 1.3	0.0	0.0	(2.3)	(2.3)	0.0	0.0	652.2	649.9
Administration	M&S	0.0	0.0	0.0	0.0	0.0	0.0	19.1	
	SWF	11.6	11.6	35.8	35.8	0.0	0.0	419.1	
	OH	3.6	0.0	11.1	11.1	0.0	0.0	128.2	
	Total 1.4	15.1	11.6	46.9	46.9	0.0	0.0	566.4	613.4
Layer 0 Silicon	M&S	2.7	5.9	17.9	22.1	13.2	0.0	206.6	
	SWF	19.2	19.2	109.5	109.5	0.0	0.0	1,138.9	
	OH	6.5	0.0	37.4	37.4	0.0	0.0	374.4	
	Total 1.6	28.3	25.1	164.8	169.0	13.2	0.0	1,719.9	1,884.7
AFEIIt	M&S	60.3	8.4	282.2	237.2	308.2	0.0	332.8	
	SWF	51.8	51.8	98.2	98.2	0.0	0.0	11.7	
	OH	25.8	0.0	76.7	76.7	0.0	0.0	57.1	
	Total 1.7	137.9	60.1	457.1	412.1	308.2	0.0	401.7	858.8
Total Project	M&S	163.6	17.4	436.3	27.8	204.7	4.8	4,037.2	
	SWF	98.7	98.7	315.4	315.4	0.0	0.0	2,412.8	
	OH	44.3	0.0	156.2	156.2	0.0	0.0	1,118.0	
Grand Total		306.5	116.1	907.9	499.4	204.7	4.8	7,568.0	8,475.9

Total Project Cost (Inception To Date) =	8,475.9
Total Project Obligations w/ Indirect =	8,680.6

Total MIE Costs Through 6/30/05
Includes PO's, but not RIPS
Includes RunIIb Silicon + Closeout Costs